

current application by reference as disclosed in Paragraph [0002] of the current application. Accordingly, no new matter has been added.

Please cancel Claims 97, 126, and 147-168 and add new Claims 169-180. Claims 96 and 125 are amended and Claims 98-124 and 127-146 are unchanged. Claims 1-95 were previously canceled. In view of these changes, Claims 96, 98-125, 127-146 and 169-180 remain pending in the application. These amendments incorporate the subject matter from Dependent Claims 97 and 126 into Independent Claims 96 and 125. Accordingly, the following discussions address the rejection of Independent Claims 97 and 126.

## **1. WANG IS NON-ANALOGOUS ART**

The Examiner rejects Claims 97 and 126 as being obvious in view of U.S. Patent 6,127,278 (Wang) combined with of U.S. Patent 4,927,781 (Miller). In order for the Examiner “to rely on a reference under 35 USC §103, it must be analogous prior art.” See header of MPEP §2141.01(a). Applicant submits that Wang is non-analogous art and is not properly combined with Miller.

MPEP §2141.01(a) provides a two-part test for determining whether a piece of prior art is analogous prior art. First, “the reference must ... be in the field of the applicant’s endeavor.” MPEP §2141.01(a) also cites *Wang Laboratories, Inc. vs. Toshiba Corporation*, 993 F.2d 858, 26 U.S.P.Q. 2d 1767 (Fed. Cir., 1993). Applicant’s field of endeavor is optics while Wang’s field of endeavor is electronics. See Wang, column 1, line 13-20, etc. Accordingly, Wang is not in the applicant’s field of endeavor and the Wang reference fails the first part of the test.

MPEP §2141.01(a) sets forth the second part of the two-part inquiry when it states that if the reference is not in Applicant’s field of endeavor, it must “be reasonably pertinent to the particular problem with which the inventor was concerned.” Further, a “reference is reasonably pertinent if ... it ... logically would have commended itself to an inventor’s attention in considering his problem.” See MPEP §2141.01(a) citing to *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).

The inventor’s problem is set forth in the Background of the specification and is evident in the Claims. The Applicant is trying to form waveguides with a smoothness level better than 220 nm. As a result, Wang must commend itself to the attention of an inventor trying to form a surface smoother than 220 nm. However, Wang does not teach or suggest the level of

smoothness that can be achieved with the Wang etch. As a result, a person of ordinary skill would have no reason to consult Wang as a means of addressing the problem of smoothness. As a result, Wang is not “pertinent to the particular problem with which the inventor was concerned” as required by MPEP 2141.01(a).

Because Wang is both from a different field of endeavor and is not reasonably pertinent to the Applicant’s problem, Wang fails both parts of the MPEP §2141.01(a) test for determining whether Wang is analogous prior art. Because Wang is not analogous prior art, Wang is not available for use in a rejection under 35 USC §103 and the rejection should be withdrawn.

## **2. WANG AND MILLER DO NOT PROVIDE AN EXPECTATION OF SUCCESS.**

A prima facie case of obviousness is not established unless “there (is) a reasonable expectation of success” when combining the references. See MPEP §706.02(j). As set forth in both the Claims and Background of the application, the Applicant is trying to form waveguides with a smoothness better than 220 nm. As a result, Wang and Miller must provide an expectation that a waveguide with a smoothness level better than 220 nm can be achieved. However, neither Wang nor Miller teach or suggest the level of smoothness that can be achieved with the Wang etch. As a result, the combination of Wang and Miller do not provide the required expectation of success.

The burden is on the Examiner to show where the expectation of success can be found. See MPEP §2142. Accordingly, the Examiner is respectfully requested to show where Wang and Miller provide an expectation that a smoothness level better than 220 nm can be achieved.

## **3. WANG AND MILLER DO NOT TEACH OR SUGGEST EACH OF THE CLAIM LIMITATIONS**

A prima facie case of obviousness is not established unless Wang and Miller teach or suggest all the claim limitations. See MPEP §2142. The claims specify forming “one or more waveguide surfaces with a smoothness less than 220 nm.” Neither Wang nor Miller teach or suggest that the Wang etch can provide a smoothness level less than 220 nm. As a result, Wang and Miller fail to teach or suggest each of the claim limitations.

#### 4. WANG DOES NOT SUPPORT AN INHERENCY REJECTION

The Examiner is relying on Wang inherently providing a smoothness level less than 220. MPEP §2112 sets forth the requirements for a proper inherency rejection. MPEP §2112 cites the Federal circuit as stating:

To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.’ *In re. Robertson*, 163 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

MPEP §2112.01 further provides that:

Therefore, the prima facie case of obviousness can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re. Best*, 195 USPQ 430, 433 (CCPA 1977)(emphasis in MPEP).

The attached Declaration provides the results of experiments performed using the Wang etch. Table 1 sets forth the variables that were used to etch silicon according to the first step of Wang. Table 1 also sets forth where these variables are found in the Wang text. Accordingly, Table 1 illustrates that the etch was performed according to the conditions set forth in Wang. The picture accompanying the Declaration shows the surface formed by this etch. The etch formed a surface having a smoothness of ~250 nm as stated in the Declaration. This smoothness falls outside the smoothness level specified in Independent Claim 1. Further, this smoothness is more than four times the smoothness level of 50 nm specified in Claims 169 and 175 and more than 9 times the smoothness level of 25 nm specified in Claims 116 and 142. Accordingly, an etch according to step 1 of Wang does not necessarily provide the smoothness level specified in the claims as required for a proper inherency rejection.

Variable	Variable Value	Location in Wang where value specified.
Coil Power	700 W	Column 4, line 25.
Coil Frequency	12.56 MHz	Column 4, line 3.
Bias Power	30 W	Column 4, line 28

Bias Frequency	400 KHz	Column 4, line 7.
SCCM SF <sub>6</sub>	20	Column 4, line 48.
SCCM HBr	40	Column 4, line 35-36.
SCCM O <sub>2</sub>	10	Column 4, line 36-37.
Ratio SF <sub>6</sub> :HBr:O <sub>2</sub>	1:2:0.5	Column 4, line 35-48.
Pressure	15 mT	Column 4, line 7.
Etcher	Applied Materials Centura Decoupled Plasma Source (DPS) DT	Column 3, line 3.

**Table 1: First Step**

Table 2 sets forth the variables employed to etch silicon in accordance the second step of Wang. Table 2 also sets forth where the Wang text discloses the use of these variables. Accordingly, Table 2 illustrates that this etch was performed according to the conditions set forth in Wang. As shown in the Declaration, this etch formed black silicon. Accordingly, an etch according to step 2 of Wang does not necessarily provide the claimed characteristics as required for a proper inherency rejection.

	Experimental Condition	Location in Wang where condition specified.
Coil Power	700 W	Column 4, line 26.
Coil Frequency	12.56 MHz	Column 4, line 3.
Bias Power	30 W	Column 4, line 28
Bias Frequency	400 KHz	Column 4, line 7.
SCCM SF <sub>6</sub>	20	Column 5, line 8.
SCCM HBr	40	Column 5, line 8.
SCCM O <sub>2</sub>	17	Column 5, line 8.
Ratio SF <sub>6</sub> :HBr:O <sub>2</sub>	1:2:0.85	Column 5, line 8.
Pressure	15 mT	Column 4, line 7.
Etcher	Applied Materials Centura	Column 3, line 3.

	Decoupled Plasma Source (DPS) DT	
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**Table 2: Second Step**

There may be some probability that a person skilled in the art could choose the variable values set forth in Wang such that the claimed smoothness levels are achieved. "Inherency, however, may not be established by probabilities or possibilities." See MPEP §2112 citing *Robertson*. Because the claimed characteristics do not necessarily result from the conditions set forth in Wang, Wang does not support an inherency rejection and the rejection under 35 USC §103 should be withdrawn.

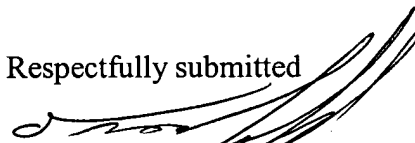
CONCLUSION

In light of the Amendments and arguments set forth above, Applicants believe they are entitled to a letters patent. The Examiner is encouraged to telephone or e-mail the undersigned with any questions.

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Respectfully submitted



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